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FIBROUS QUARTZ FROM RHODE ISLAND

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MOST collections of New England minerals include specimens of a peculiar fibrous variety of quartz from one or more localities in southeastern Massachusetts or Rhode Island. The occurrence of this material at Worcester, Massachusetts, has been described by Professor B. K. Emerson and Dr. Perry,[1] and explained as "originally a prochlorite possibly made fibrous by pressure and is now changed in part to silica by the action of the acids formed on the oxidation of the pyrite." As the occurrences at two localities in Rhode Island which have been studied by the writer appear to be of rather different character and origin from the above, a brief description of them is here presented.

The Carboniferous sedimentary rocks of the Narragansett Basin have suffered a great deal of deformation during their long history, resulting in the changing of the coal deposits, which the strata originally contained, into graphite, which has been mined at the "coal" mine at Portsmouth, R. I., and at Fenner's Ledge, in Cranston, near Providence, R. I. In connection with these metamorphic processes extensive dikes and masses of granite were intruded wherever fissures were opened. Hot solutions from the magmas penetrated for long distances, forming quartz veins of various sizes.

Most of the quartz veins of this kind in Rhode Island carry relatively small amounts of foreign materials in them, which appear as crystals of hornblende, actinolite, epidote, rutile, fluorite or various carbonate or sulfide minerals. Such minerals usually show little or no regular arrangement within the vein; this is the case in the famous hornblendic quartz from Cumberland, R. I., in which a growth of long slender black hornblende blades, which spread out in all sorts of directions within the cavity, has been followed by an infiltration of quartz, filling in all the spaces between them. But in the case of the quartz of fibrous habit herein described there is a regular arrangement and evident close interrelation of the quartz and the actinolite with which it is associated.

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[1] Geol. Worcester, Mass., p. 17, 1903; U. S. Geol. Survey Bull. 597, 63, 1917.

The fibrous quartz veins are usually narrow, but they range in width from 1 or 2 mm. to 15 cm. or more. They occupy fissures extending in various directions thru the Carboniferous slaty shales. The fibrous form of quartz can be observed to grade into massive white vein-quartz, demonstrating its primary origin. The massive portion of the vein is usually free from appreciable amounts of visible impurities, except a little pyrite. The color of the fibrous material ranges from pure white to greenish, due to the admixture of actinolite. The latter is present in all sorts of relative proportions in different veins and portions of the same vein, as shown by the analyses, given below. A portion of the greenish fibrous quartz was ground to flour, and the mineral giving rise to the color separated from the quartz by means of a heavy solution; the green portion showed the properties of an amphibole; its color and characteristic extinction angle identify it in the microscopic section.

In appearance the fibrous quartz much resembles asbestos, for which it might readily be mistaken. Its fibers are generally very slender, only a fraction of a millimeter in diameter, altho at times the structure is columnar and the fibers are coarse, with occasional films of pyrite between them. As in chrysotile asbestos, the fibers lie at right angles to the walls of the cavity; they are also often bent into a graceful double curve in the center of the vein, evidently by a movement of one wall with reference to the other. Portions of the wall rock are often found in the center of the vein, as with chrysotile. The fibers are long and very flexible, but altho they look soft will readily penetrate the skin.

Under the microscope the fibrous quartz is seen to be composed of exceedingly long prismatic quartz crystals lying between minute actinolite prisms whose length in comparison to their thickness is also relatively great; in the latter mineral this is, of course, a normal habit. The quartz prisms are sometimes forty times as long as they are thick, polarizing as a unit thruout their length. At their ends other crystal units may adjoin them, and form a still longer fiber. The parallel growth of the actinolite has evidently been the chief cause of the elongated development of the quartz prisms.

The writer has made three analyses of this fibrous quartz, just as it comes from the vein, which show clearly the variation in the amount of actinolite from one specimen to another. They are presented in table 1.

TABLE 1

ANALYSES OF FIBROUS QUARTZ

	1	2	3
SiO_2	77.15	94.92	91.83
Al_2O_3	8.72	4.56	1.61
Fe_2O_3	7.68		3.81
MgO	3.96	tr.	1.37
CaO	0.70	tr.	0.80
H_2O	1.40	0.16	0.70
CO_2	——	——	0.50
S (pyrite)	0.52	——	0.12
Sums	100.13	99.64	100.74

1. Greenish, from Fenner's Ledge, Cranston.
2. White, same locality as 1.
3. Greenish, Portsmouth.

Good specimens of this fibrous quartz are available to collectors at Fenner's Ledge, Cranston, in the suburbs of Providence, readily reached by trolley, where quarrying is being carried on to obtain graphite and road material. Fossil ferns and beautiful iridescent limonite films are also obtainable at times in the shales of this quarry. The fibrous quartz from Portsmouth was found on the west side of the island, occurring at the "coal" mine (where excellent fossil ferns are readily procured) and on the hill above the Bristol ferry landing.

POSITION OPEN

The New York Civil Service Commission announces that it will receive applications for the position of mineralogist in the State Museum, Albany. The salary offered is $1,740, and men only are eligible. Applicants should be graduates of a university, college, or technical school and specially trained in the science of mineralogy.

DEVELOPING CRYSTALLIZED MINERAL SPECIMENS[1]

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The writer takes particular pleasure in developing specimens that are well crystallized, but have too much matrix about them. Considerable difficulty is experienced in trimming delicate specimens such as those from Paterson, N. J. A hammer and chisel, no matter how skilfully used, will jar and shatter the crystals of minerals of very perfect cleavage such as apophyllite, calcite, natrolite, etc. The following have been found to be safe and useful methods.

The materials necessary are a strong bench vise with a considerable opening of the jaws, and a three-cornered file having a ¾-inch face on each side. The file may either be used in its entire length or cut into pieces of an inch or so. The file is placed against the back jaw of the vise, and the specimen held with the back of the matrix against the sharp edge of the file. The front jaw is then closed, any uneven surface of the specimen being filled with a small piece of wood. On closing the vise with a gentle force, the rock will always part in the desired place without any jar, and the most delicate crystals remain unbroken.

Particularly hard matrix with very fragile crystals in a specimen worth saving and taking trouble with may be treated thus: Around the edge of the surface to be saved build a wall of paper, wax, clay or putty. Warm the specimen in an oven. Melt some good stiff paraffin, and when warm (not hot) and completely fluid, pour over the crystals on the warm specimen, until they are deeply imbedded. Let it cool thoroly, even putting it in a refrigerator to harden. The specimen can then be worked on without danger of the crystals jumping off. To remove the paraffin, place the specimen in a pot or pan, cover with water and heat; the wax will melt and float on the top of the water and can be skimmed or poured off; repeat the process until all the wax has been removed, and the crystals will be left in perfect condition.

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[1] Supplementary to the article by Dr. Hawkins, *Am. Min.* 2, (8), 101, August, 1917. Further contributions on this subject are invited.

NOTES ON GAGEITE FROM FRANKLIN FURNACE, NEW JERSEY

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In February I received a small specimen which was labeled "pyrochroite and gageite, Franklin Furnace, N. J." Both minerals were in microscopic crystals in small cavities in a matrix of calcite, zincite and perhaps calcozincite, only large enough for a rakestraw mount.

It reminded me of a hand specimen in my cabinet consisting chiefly of the clear bright red "ruby zincite" in a matrix of granular franklinite in calcite, and containing some small cavities lined with microscopic crystals, which in 1897 I had labeled as consisting of two minerals unknown to me. Upon examining it I found they were evidently the same as the minerals in the small specimen above noted. One is in black crystals, apparently cubes or rhombs of small angle,[1] and the other, the gageite, in long acicular white or yellowish prisms either single, interlaced, or in divergent fan- or brush-shaped groups, resembling in habit the millerite from Antwerp, N. Y.

The gageite is chiefly superposed upon the black crystals, but it also occurs on the zincite or calcite in interlaced crystals as well as in the divergent clusters. The latter form attractive objects for the microscope, but require a fairly high power objective (inch or half inch), as the longest crystals in my specimens are not over one millimeter in length.

As an empirical formula for the mineral Dr. A. H. Phillips who described it,[2] gives $(RO)_8\ (SiO_2)_3.2H_2O$; he states that before the blowpipe the clear crystals assume at once a light bronze color which darkens to a deep bronze or nearly black, and in the closed tube it yields water with the same change of color. It seems probable that by means of these features other collectors may find this mineral to be present on specimens of Franklin Furnace minerals in their possession.

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[1] The black crystals give a fine manganese reaction with a borax bead and give off much water in the closed tube.

[2] Phillips, Alex. H., "Gageite, a new mineral from Franklin Furnace, N. J.," *Am. J. Sci.* **30**, 283–284, 1910.

FIELD IDENTIFICATION OF DIASPORITE

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The recognition of diasporite in bauxite deposits[1] and in comparatively large masses in association with clay[2] suggests that this mineral may be more widespread than heretofore supposed. As it may possibly prove to be of commercial value, either as an ore of aluminium or for the manufacture of abrasives, there is likely to be need for a rapid and convenient method of identifying this mineral in the field. The fact that it possesses, for a light-colored mineral, the exceptionally high specific gravity of 3.4, suggests that the method often used in scientific work, that of separation by heavy liquids, may be of practical value in this connection. A heavy liquid suitable for the purpose is bromoform, which can be purchased in many drug stores, or from dealers in chemicals. This has a specific gravity of about 2.8, so that pure diasporite will readily sink in it, whereas quartz, calcite, clay, etc., having distinctly lower gravities, will float.

The rock or clay to be investigated must be dry, and should be crushed to something like 60-mesh size, and the fine dust be removed by sifting or blowing. A pinch of the granular material may then be shaken up with bromoform in a small glass vial. If diasporite is present, it will tend to settle to the bottom, altho if the grains are coated with clay, films of air may remain attached to them, and sinking be prevented. It may then be necessary to boil the liquid containing the suspended particles for a few moments, until all are thoroly wetted. Bromoform is not inflammable, so there is no danger connected with this process, but it is somewhat poisonous, especially if partially decomposed by moisture or sunlight, so should not be inhaled.

There are of course other minerals which possess high specific gravities, but most of them are recognizable by other properties. Iron and titanium oxide minerals, such as magnetite, ilmenite, rutile, etc., are all dark in color; and any light-colored minerals other than diasporite which also sink are likely to be of even greater commercial interest than it.

[1] Wysor, D. C., *Econ. Geol.*, **11**, 42–50, 1916.

[2] See *Am. Min.*, **2** (12), 144, 1917.

ICELAND SPAR IN MONTANA

Hardly had the query, "Can not some American mineralogist discover a workable deposit [of iceland spar]?" appeared in our columns[1] than announcement was made by Dr. Charles L. Parsons, of the U. S. Bureau of Mines, that such a deposit had been found in Montana.[2] "The crystals from the Montana deposit," he says, "appear to be the nearest approach to Iceland spar yet uncovered in any part of the world." The deposits have been found to be of great extent and easily workable. Some of the "crystals" (probably cleavage rhombs) are slightly turbid, cloudy or milky, and others, while perfectly clear, show cleavage cracks; these cracks are probably due to too violent treatment in the process of mining the material, and can probably be avoided by careful working. Examination by the Bureau of Standards indicates that the material is suitable for optical work; and one of the best proofs of its value is the report that 600 pounds of it were at one time sold in Germany. Let us hope that the monopoly of iceland spar which that country endeavored to obtain in preparation for the present war will be prevented by this discovery.

TRANSPARENT QUARTZ (ROCK-CRYSTAL) WANTED

The Government is in need of quartz of optical quality. Crystals or fragments must be flawless and at least 3 x 6 centimeters (1¼ x 2½ inches) in diameter.

Patriotic collectors are urged to send any material of the above description which they may have on hand to Dr. George P. Merrill, U. S. National Museum, Washington, D. C.

The need is urgent!. Act at once!

Do your bit toward winning the war!

Dr. A. D. Brokaw, assistant professor of mineralogy at the University of Chicago, has taken charge for the government of oil production in the eastern part of the country.

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[1] *Am. Min.*, 3 (5), 47, May, 1918.

[2] *Science*, 47 (1221), 508–509, May 24, 1918.

NOTES AND NEWS

The death is announced, on December 28, 1916, of Carl Adolf Ferdinand Hintze, author of the celebrated "*Handbuch der Mineralogie.*" Born in Breslau August 17, 1851, he studied at Breslau, Bonn, Berlin and Strassburg, carrying on a mineral business for some years after his graduation. In 1884 he began teaching at Bonn, then at Breslau, becoming in 1892 ordinary professor and director of the Mineralogical Institute and Museum, which post he held until his death. The first number of his "*Handbuch*" appeared in 1889. Volume 2 (1,841 pages) treated of the silicates and titanates. Sixteen parts (2,560 pages) of Volume 1, the elements, sulfides, oxides and halides, have been published, but unfortunately the carbonates, sulfates, borates and phosphates remain untouched.

We regret to record the death on June 12, 1918, of William E. Hidden, the well-known mineralogist of Newark, N. J. An account of his life and work will appear in our columns in the near future.

PROCEEDINGS OF SOCIETIES

THE PHILADELPHIA MINERALOGICAL SOCIETY

Wagner Free Institute of Science, April 11, 1918

A stated meeting of the Philadelphia Mineralogical Society was held on the above date with the President, Dr. Leffmann, in the chair. Ten members and seven visitors were present.

Mr. Charles W. Hoadley, Englewood, N. J., was elected an active member.

Dr. D. Wilbur Horn presented a paper on "Some Ideas Relating to Water of Crystallization." He described the results of his studies of copper-ammonia compounds, their interpretation according to the Phase Rule, and analogies of these to water of crystallization. The lecturer illustrated his remarks with lantern slides and a space model.

Samuel G. Gordon, *Secretary*

ABSTRACTS OF MINERALOGIC LITERATURE

MINIUM FROM BIBERWIER, TYROL. E. Dittler. *Centr. Min. Geol.*, **1916**, 521; thru *J. Chem. Soc.*, **112**, II, 144, 1917.

Minium, Pb_3O_4, occurs as an alteration product of galena. E. T. W.

NATROJAROSITE FROM KUNDIP, WESTERN AUSTRALIA. Edward S. Simpson and Maurice A. Brown. *J. Roy. Soc. W. Austr.*, **1916**, I, 45–54; thru *J. Chem. Soc.*, **112**, II, 146, 1917.

Minutely crystalline masses of ocher-yellow material in an oxidized gold ore prove to be natrojarosite. Analysis and brief description are given.

E. T. W.

THE MINERALS OF GLAMORGAN. F. J. North. *Trans. Cardiff (Wales) Naturalists' Soc.*, **49**, 1916, 18–51.

An annotated list and bibliography of 31 minerals found in Glamorgan County, Wales. S. G. G.

THE SODIUM-POTASSIUM NEPHELITES. N. L. Bowen, Geophysical Laboratory. *Am. J. Sci.*, [4], **43**, (2), 115–132, 1917.

An experimental study of the binary system: $NaAlSiO_4$—$KAlSiO_4$. The sodium compound has two enantiomorphous forms, nephelite and carnegieite (inversion point 1248°). The potassium compound shows two forms, kaliophilite (isomorphous with nephelite), and an orthorhombic one. Kaliophilite and nephelite form an unbroken series of solid solutions, and it is therefore concluded that $NaAlSiO_4$ and $KAlSiO_4$ are the fundamental molecules of natural nephelites. In addition they contain variable amounts of plagioclase in solid solution, the plagioclase varying from albite to anorthite, the latter accounting for the lime content, and the former for the excess of silica in the natural mineral. S. G. G.

TWO SO-CALLED HALLOYSITES FROM GEORGIA AND ALABAMA. P. A. van der Meulen, Cornell University. *Am. J. Sci.*, [4], **43**, (3), 140–144, 1917.

The specimens are shown by analysis to be higher in alumina and lower in silica than typical halloysite, but this is found to be due to mechanical admixture of hydrargillite. The refractive indices of the latter are: $\alpha = \beta = 1.554$, $\gamma = 1.576$. Dehydration experiments are described. E. T. W.

TUNGSTEN MINERALS AND DEPOSITS. Frank L. Hess, U. S. G. S. *U. S. Geol. Survey, Bull.* **652**, Washington, 1917. 86 pp., 1 fig., 25 plates.

An elaborate description, with many illustrations, some in color, and full directions for identifying these minerals. S. G. G.

THE ENRICHMENT OF ORE DEPOSITS. William Harvey Emmons, U. S. G. S. *U. S. Geol. Survey, Bull.* **625**, Washington, 1917. 530 pp., 29 fig., 7 plates.

The bulletin contains much data on the paragenesis of minerals.

S. G. G.

OCCURRENCE OF EUXENITE IN SOUTH SHERBROOKE TOWNSHIP, ONTARIO. W. G. Miller and C. W. Knight. *Am. J. Sci.*, [4], **44**, (3), 243–244, 1917.

The euxenite occurs in a granite pegmatite in masses from the size of a pea to two inches, imbedded in feldspar and mica, associated with pyrite. An analysis is given. S. G. G.

A REVIEW OF THE AMORPHOUS MINERALS. Austin F. Rogers, Stanford University. *J. Geol.*, **25**, (6), 515–541, 1917.

This paper comprises a discussion of the amorphous minerals, their colloidal origin, criteria for their recognition, nomenclature, etc. The term *colloform* is proposed for the rounded, more or less spherical, forms assumed by colloidal and metacolloidal substances in open spaces, this term embracing the spherical, botryoidal, reniform, stalactitic, and mamillary forms, which intergrade. Colloform minerals may be either amorphous or crystalline. In the criteria for the recognition of amorphous substances a serious difficulty is noted in that many amorphous substances are doubly refracting, an example being noted in the phosphorite from Lassa Island, in which double refraction of the amorphous bands of "collophane" is greater than that of the accompanying crystalline dahllite. The writer further discusses their recognition as mineral species, as some of these substances are of more or less definite character, especially the amorphous equivalents of crystalline minerals, emphasizing that they should be treated as distinctive minerals with distinctive names. About twenty of the more prominent and well-defined amorphous minerals are described and discussed. New names are given to amorphous cadmium sulfide (*xanthochroite*), amorphous copper silicate (*cornuite*), corresponding to greenockite and chrysocolla respectively. Arguments are also advanced for treating the natural hydrocarbons and natural glasses as mineraloids.

S. G. G.

PRELIMINARY NOTE ON THE OCCURRENCE OF CHALMERSITE, CuFe$_2$S$_3$, IN THE ORE DEPOSITS OF PRINCE WILLIAM SOUND, ALASKA.

Bertrand L. Johnson, U. S. Geol. Survey. *Econ. Geol.*, **12**, (6), 519–525, 1917.

Chalmersite, hitherto only known as minute acicular crystals from the Morro Velho gold mine in Brazil, is found massive, as a prominent constituent of copper ore, at eight widely separated localities in this district. The mineral is very pale yellow, opaque, massive, has a conspicuous cleavage, metallic luster, strongly but variably magnetic. It occurs in the copper deposits occupying shear zones wholly or partly in greenstones, intergrown with chalcopyrite. Two analyses are given. S. G. G.

AN ANDALUSITE MASS IN THE PRE-CAMBRIAN OF THE INYO RANGE, CALIFORNIA.

Adolph Knopf, U. S. Geol. Survey. *J. Wash. Acad. Sci.*, **7**, (13), 549–552, 1917.

A description of a mass of andalusite about 500 feet long, 300 feet wide, and at least 300 feet deep, occurring 4 miles east of Milner Station, on the Nevada and California Railroad, in southern Mono County, Cal. The andalusite rock carries long stringers of quartz containing considerable lazulite, and also locally hematite, and muscovite. It is provisionally suggested that the andalusite originated from the volcanic porphyry which borders the mass on the north and northeast, thru pneumatolytic metamorphism sequent upon the granitic intrusions that occur in the range. S. G. G.

A SECOND METEORITE FIND IN FLORIDA.

G. P. Merrill, U. S. Nat. Mus. *Am. J. Sci.*, [4], **45**, (1), 64–65, 1918.

Description of a spherulitic chondrodite found at Eustis, Fla. S. G. G.